

Date: Friday, 3/30/2007 8:27:55 AM
 User: Kim Johnston

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: 407 FWD X-TUBE
Job Number	: 31552		
Estimate Number	: 12348		
P.O. Number	: <i>N/A</i>	Part Number	: D407667105
This Issue	: 3/30/2007 S.O. No. : <i>N/A</i>	Drawing Number	: D407-667-145 REV B
Prsht Rev.	: NC	Project Number	: <i>N/A</i>
First Issue	: <i>N/A</i> Type : LANDING GEAR	Drawing Revision	: <i>N/A</i>
Previous Run	: 31055	Material	: <i>N/A</i>
Written By	:	Due Date	: 4/5/2007
Checked & Approved By	:	Qty:	1 Um: Each
Comment	: Est Rev: F 05.09.01 Add holes for compatibility with Bell Skidtubes KJ/JLM		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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N 1.0	DC	DOCUMENT CONTROL
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KS 07.03.30 ①

Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP ~~D206~~ 667-105 CHG002

2.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
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Comment: LANDING GEAR RESOURCE 1

PULL FROM STOCK

1 X D407-667-105 B 19139 CHG001

1 X D407-667-105 B _____ CHG001

EL 7-8-10

3.0	D407667105	FWD Crosstube
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
 FWD Crosstube

4.0	D2856400	Abrasion Strip
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Comment: Qty.: 1.2138 f(s)/Unit Total : 1.2138 f(s)

Pick:

Qty Part number Description Batch

2 D2856-400(Cut to 6.94") Abrasion Strip

w/19 Prod.

5.0	D2873043	Nut Plate Assembly
-----	----------	--------------------



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-043 Nut Plate 22286

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 3/30/2007 8:27:56 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 407 FWD X-TUBE

Job Number: 31552

Part Number: D407667105

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

D2873045

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-045 Nut Plate

32 164

ml 07 08 14

7.0

D28911

Support 2.25 dia



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2891-1 Support

N/A Gnd.

8.0

MS20601AD4W10

RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number Description Batch

14 MS20601AD4W10 Rivet

104093

ml 07 08 14

9.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-20 Clamp

N/A Gnd.

10.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579. Note: (3) top holes should be facing up.

2-Install supports and clamps as per Dwg D407-667-145. Torque clamps to 80-100 in lb

3-Install nut plates as per Dwg D407-667-145. Touch-up rivet heads with Imron paint.

ml 07 08 14

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 3/30/2007 8:27:56 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 407 FWD X-TUBE

Job Number: 31552

Part Number: D407667105

Job Number:



Seq. #:

Machine Or Operation:

Description :

11.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Job 24 ①

12.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING
REPAINT CUFFS

ml 07 08 24

①

13.0

QC14

Inspect Spray Paint



Comment: Inspect Spray Paint

BT 07 - 08 - 25

14.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1
Pick Packing Kit

15.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
Bolt
Batch: *M1931*

SP

16.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
Nut
Batch: *M5209*

SP

17.0

AN510A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)
Batch: *M104936*

SP

18.0

AN530A

BOLT



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
Pick:Packing Kit
QtyPart number Description Batch
4 AN5-30A Bolt *M19022*

SP 7/8/28 SP

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: 12 Date: 07/08/07

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 3/30/2007 8:27:56 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 407 FWD X-TUBE

Job Number: 31552

Part Number: D407667105

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Pick: Packing Kit

Qty Part number Description Batch

18 AN960JD516 Washer

M104186

7/8/28 SO

20.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

5091 08/29

21.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D407-667-105

Location:

PPP Rev:

B

7/8/29

SO

U

22.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

17/08/29

Job Completion



U 8-08-29

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	31552
Description: Crosstube Assembly	Part Number:	D407-667-145
Inspection Dwg: D407-667-145 Rev: B		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

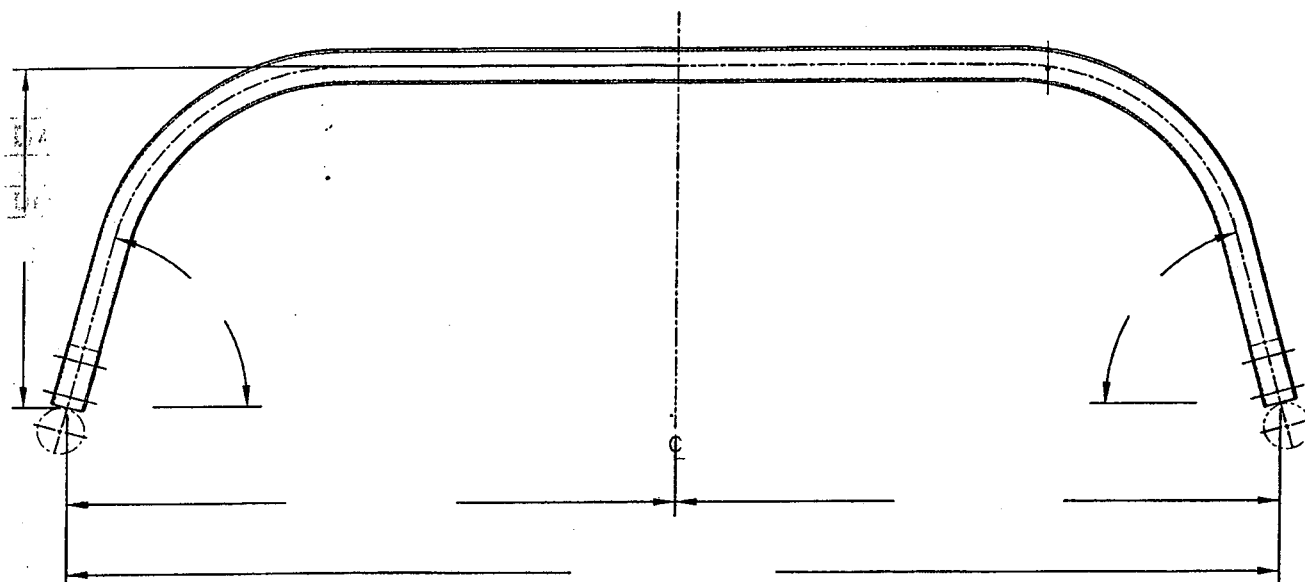
Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000				
	1.865	+0.005/-0.000				
	1.878	+0.005/-0.000				
	1.970	+0.005/-0.000				
	2.030	+0.005/-0.000				
	2.165	+0.005/-0.000				
	0.125	+/-0.010				
	R0.063	+/-0.010				
	R0.500	+/-0.010				
	R0.063	+/-0.010				
	4.438	+/-0.010				
SIDE B	2.240	+0.005/-0.000				
	1.865	+0.005/-0.000				
	1.878	+0.005/-0.000				
	1.970	+0.005/-0.000				
	2.030	+0.005/-0.000				
	2.165	+0.005/-0.000				
	0.125	+/-0.010				
	R0.063	+/-0.010				
	R0.500	+/-0.010				
	R0.063	+/-0.010				
	4.438	+/-0.010				
	113.20	+/-0.020				

Measured by:		Audited by:		Prototype Approval:	N/A
Date:		Date:		Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.04.21	New Issue (P/O D407-667-105)	KJ/RF	
B	06.03.09	Dwg Rev updated	KJ/JLM	

DART AEROSPACE LTD	Work Order:	31552
Description: Crosstube High Fwd (407)	Part Number:	D407-667-105
Inspection Dwg: D407-667-145 Rev: B		Page 1 of 1

Required Dimension	Min	Max
Height	23.48	23.60
1/2 Span	45.88	46.0
Angle	54	56
Total Span	91.76	92.0



Comments

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	<i>[Signature]</i>

DART

DESIGN PH	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED DS	APPROVED DS	DRAWING NO. D407-667-145	REV. B SHEET 1 OF 3
DATE 05.07.26		TITLE CROSSTUBE ASS'Y (407 HIGH FWD)	SCALE NTS
A	02.05.08	NEW ISSUE	
B	05.07.26	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	

05.07.26

UNDER REVIEW06.08.08
re-draw detailPH
07.03.00

Qty	Part Number	Description
X	D407-667-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
1	D6010-115	CROSSTUBE
2	D2856-400-694	ABRASION STRIP
2	D2873-043	NUT PLATE
2	D2873-045	NUT PLATE
2	D2891-1	SUPPORT
14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
4	MS21920-20	CLAMP

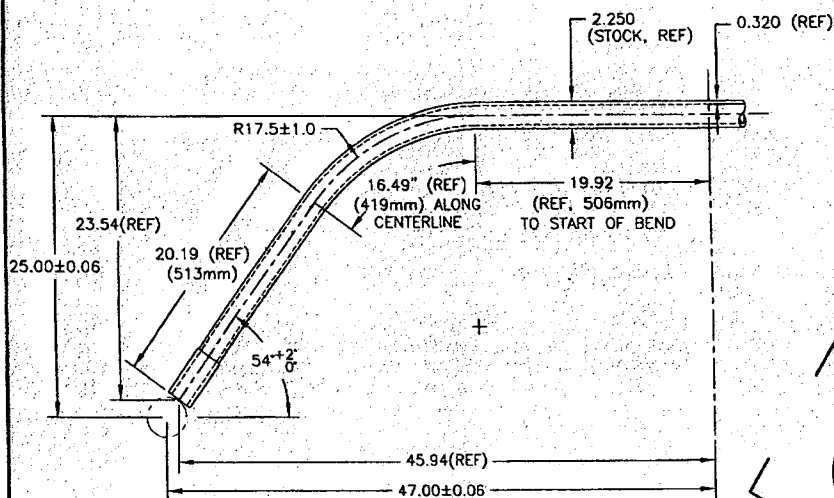
GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6010-115
FINISHED LENGTH = 113.20 ± 0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-694 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2891-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT (OPTIONAL).
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

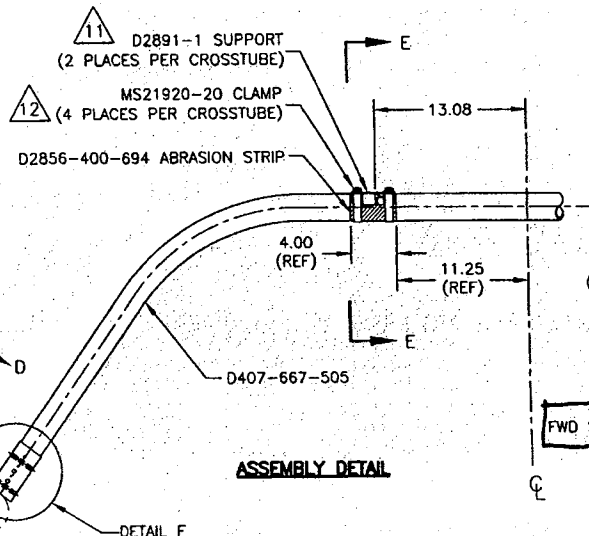
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WORK ORDER
NO. 31552

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BENDING DETAIL



ASSEMBLY DETAIL

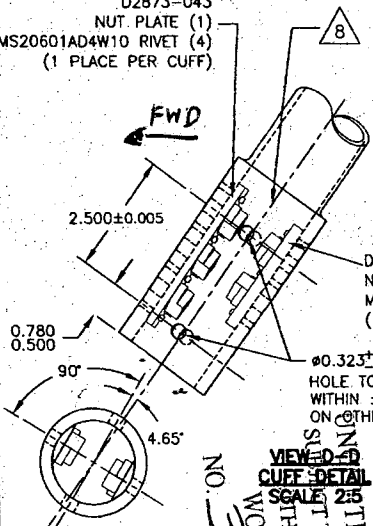
B $\pm 0.323^{+0.005}_{-0.000}$
(TYP 5 PLACES PER CUFF)
HOLE TO BE ALIGNED WITHIN ± 0.001
OF HLE ON OTHER SIDE OF CUFF

PILOT ± 0.128
C'SINK $\pm 0.225 \times 100'$
(TYP 7 PLACES PER CUFF)

FWD SIDE ONLY
DETAIL F
SCALE 2:5

UNDER REVIEW
05.08.08 PH
07.03.20

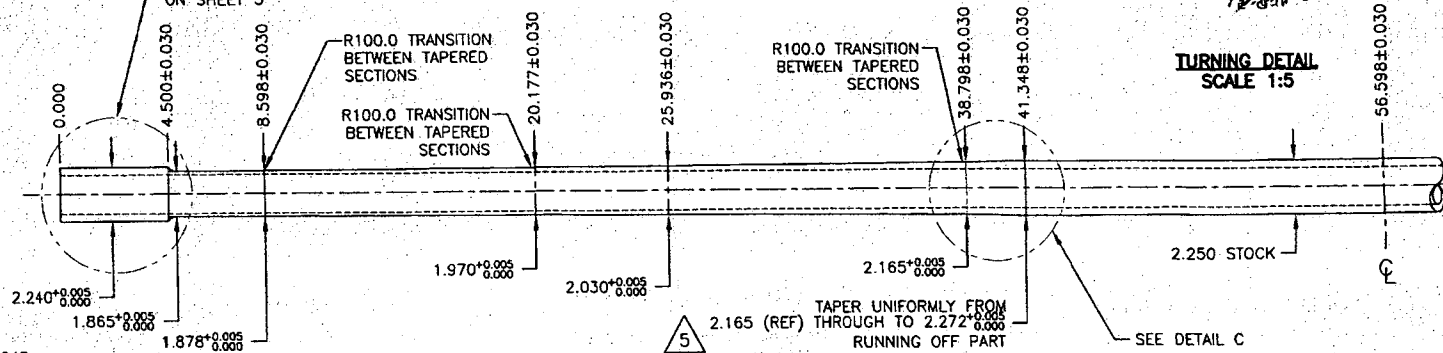
D2873-043
NUT PLATE (1)
MS20601AD4W10 RIVET (4)
(1 PLACE PER CUFF)



D2873-045
NUT PLATE (1)
MS20601AD4W10 RIVET (3)
(1 PLACE PER CUFF)

$\pm 0.323^{+0.005}_{-0.000}$
HOLE TO BE ALIGNED
WITHIN ± 0.001 OF HOLE
ON OTHER SIDE OF CUFF

SEE DETAIL A
ON SHEET 3



TURNING DETAIL
SCALE 1:5

MS21920-20 CLAMP (REF)
D2891-1 SUPPORT (REF)

SECTION E-E
SCALE 2:5

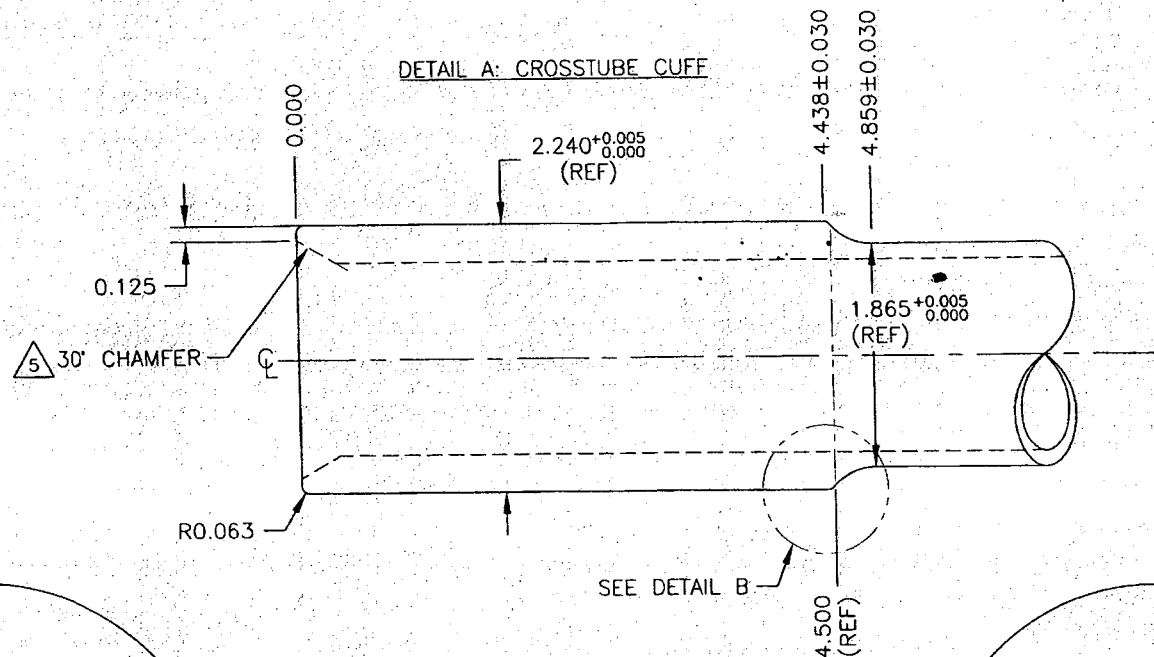
9 D2856-400-694 ABRASION STRIP (REF)

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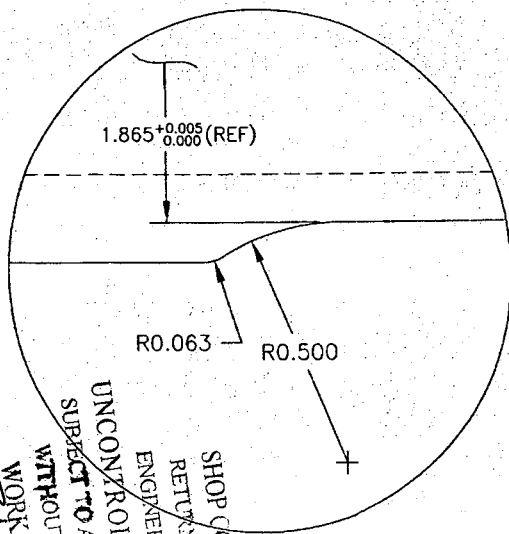
DESIGN	PH	DRAWN BY	PH	DART	DART AEROSPACE LTD. WARRIMUR, ONTARIO, CANADA
CHECKED	DS	APPROVED	DS	DRAWING NO.	D407-667-145
DATE	05.07.26	TITLE	CROSSTUBE ASS'Y (407 HIGH FWD)	REV. B	SHEET 2 OF 3
				SCALE	1:10

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WORK ORDER
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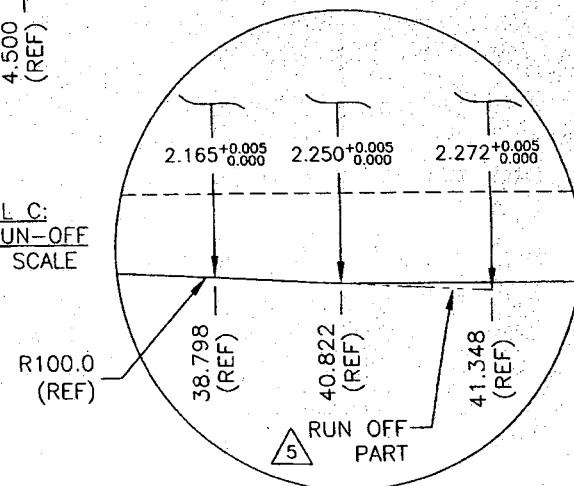


UNDER REVIEW
 06.08.10
 RE-DRAW DETAIL
 07.08.30

05.07.26



DETAIL C:
 TAPER RUN-OFF
 NOT TO SCALE



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CHECKED		DS	DS	DRAWING NO.	REV. B
DATE		05.07.26		D407-667-145	SHEET 3 OF 3
				TITLE	SCALE
				CROSSTUBE ASS'Y (407 HIGH FWD)	1:1

